a selected sample. The resulting fluorescent emission 23 is collected axially by th convergent cylindrical rectangular lens 13, and transmitted through the dichroic beamsplitter 12 and a long pass filter 14, and then focused onto the photodetector 16 by a convex lens 18. The band pass filter 14 is selected to block any background or scattered light from the radiation source. After the release of the emitted radiation 23, a scanner or conveyer system 21 causes the pinhole 17 (not drawn to size) to move to the next microchannel. In this manner, by scanning the pinhole 17, the excitation radiation and the fluorescent emission is sequentially brought to and collected from every microchannel or sample volume in the array. The permanence time of the pinhole in every sample is pre-set and electronically controlled to allow for the excitation and emission of every individual sample before moving to the next. By incorporating a moving pinhole 17, the detection system of the present invention avoids the interference caused by cross talk between channels since one sample is illuminated at the time. By using a pinhole 17, interferences due to scattered light from the optics and the mass of the glass plate 22 comprising the channels are further avoided. The system can be modified for multicolour fluorescence detection by adding a rotating filter wheel 30 (shown in Figure 1B) before the detector. The filter wheel comprises a predetermined number (usually 4) of band filters which are designed to block the radiation at the wavelengths of the excitation radiation sources and transmit fluorescence at wavelengths typically longer than those for the excitation wavelengths. The filter wheel 30, controlled by means of a rotor 26, rotates and brings sequentially the set of filtered into the path of the emission beam, thus permitting the detection of the fluorescent emission of different dyes present in the sample.

IN THE CLAIMS

Please amend Claims 1, 2, 9, and 14 and 15 as follows:

1. (amended) An optical detection system comprising:

a) at least one electromagnetic radiation source directing source radiation at a sample platform containing at least one sample;

b) at least one source radiation focusing and collimating means, positioned between the radiation source and the sample for focusing and collimating the directed source radiation into a beam of focused light onto the sample, wherein the beam has an elongated cross-section throughout its length;

c) at least one photodetector adapted for receiving light emitted from the sample;

d) at least one emitted radiation focusing means, positioned between the photodetector and the sample, for focusing the emitted light from the sample onto the photodetector; and